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ASSISTANCE IN LEATHER PRODUCTION AND MARKETING

IS/PDY/75/006

DEMOCRATIC
YEMEN,

Technical report:
**POTENTIAL OF RAW HIDES AND SKINS AND LEATHER
FOR DOMESTIC AND EXPORT MARKETING**

Prepared for the Government of Democratic Yemen by the
United Nations Industrial Development Organization,
executing agency for the
United Nations Development Programme



United Nations Industrial Development Organization

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by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of J. Ghosh, leather marketing expert

United Nations Industrial Development Organization
Vienna, 1976

Explanatory notes

Reference to "dollars" (\$) indicates United States dollars. There are one hundred cents (¢) to a dollar.

The monetary unit in Democratic Yemen is the dinar (YD). There are one thousand fils to a dinar. During the period covered by this report, the value of the dinar in relation to the United States dollar was \$US 1 = YD 0.343.

The use of a hyphen between dates (e.g. 1974-1975) indicates the full period involved, including the beginning and end years.

References to "tons" are to metric tons.

The following forms have been used in tables:

Three dots (...) indicate that data are not available.

A dash (-) indicates that the amount is nil or negligible.

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ABSTRACT

The Government of Democratic Yemen is anxious to modernize its National Tanning Factory in order to improve efficiency and increase the output of all kinds of leather to meet the demands of domestic and export markets. This is the only tannery in the country; it has an output primarily of sheep and goat skins with a few cattle and camel hides. The present capacity of the tannery is 2,000 skins per month, the greater part of which are pickled with some wet-blue and finished processed skins.

The Government requested assistance from the United Nations Development Programme (UNDP) and an expert in marketing leather was sent to Democratic Yemen for six months, from 25 April 1976 until 18 October 1976, on the project "Assistance in Leather Production and Marketing" (IS/PDY/75/006). The executing agency was the United Nations Industrial Development Organization (UNIDO).

The expert's duties were: (a) to study resources of raw hides and skins and recommend ways of fully utilizing these resources; (b) to assess current and future requirements of finished leather; and (c) to assess exportable surpluses and recommend an export marketing plan.

His recommendations were as follows:

1. Centres for the procurement of hides and skins should be opened, initially at Seiyon and Mukalla and later at Lahej.
2. A flaying expert should be employed to demonstrate the correct method of flaying and to introduce a better flaying knife.
3. Reclassification of skins should be made to include the sizes 40-50 ft² and 60-70 ft².
4. Pending completion of a training programme, the Government should endeavour to obtain the assistance of leather technologists.
5. A common pricing and discounting system should be introduced.
6. Thin and defective skins should be given special treatment.
7. A splitting machine should be obtained and a programme initiated for making split suedes, linings, and printed uppers into such products as bags or purses.

8. Contacts should be made with long-term buyers for the range of products, otherwise the continuity of volume production and economics of bulk output etc., cannot be maintained.

9. The Government should seek to co-operate with other countries on techno-economic and marketing matters.

10. The tannery and the footwear unit should be organized as a common commercial operation under one management.

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INTRODUCTION

The Government of Democratic Yemen is anxious to modernize its National Tanning Factory in order to improve efficiency and increase the output of all kinds of leather to meet the demands of domestic and export markets. This is the only tannery in the country; it has an output primarily of sheep and goat skins with a few cattle and camel hides. The present capacity of the tannery is 2,000 skins per month, the greater part of which are pickled with some wet-blue and finished processed skins.

The Government requested assistance from the United Nations Development Programme (UNDP) and an expert in marketing leather was sent to Democratic Yemen for six months, from 25 April 1976 until 18 October 1976, on the project "Assistance in Leather Production and Marketing" (IS/PDY/75/006). The executing agency was the United Nations Industrial Development Organization (UNIDO).

The expert was attached to the department of industry of the Ministry of Economy and Industry and in co-operation with the leather technologist, and under the supervision of the team-leader of the Industrial Advisory Unit in the Ministry, his duties were:

- (a) To examine the present supply system of raw skins to the tannery and formulate recommendations on measures to be taken to ensure an adequate and rapid supply of such skins;
- (b) To conduct a market study to ascertain the quality and grades of tanned and finished leather requirements in Democratic Yemen and in neighbouring countries;
- (c) To prepare a plan for promoting exports of tanned and finished leather;
- (d) To train national counterparts in undertaking the above-mentioned duties.

His recommendations are contained in the body of this report.

Simultaneously with this project, an expert in leather technology was sent to Democratic Yemen to assess the operational efficiency of the tannery and to recommend methods of modernization and expansion. The activities of the two experts were closely interrelated.

I. PROJECT ACTIVITIES

Aden, as a principal port and the most suitably situated one below the Suez Canal and the Red Sea, is the traditional transit port for the re-export of hides and skins from Ethiopia, Kenya, Somalia, Yemen and other countries. As large quantities of live goats, sheep and cattle were traditionally imported to supplement meat requirements, there has also been indirect re-exporting of hides and skins as a by-product of imported livestock. In addition to transit and re-export trade, hides and skins of local origin were exported in sun-dried and dry-salted condition.

Data on the livestock population and the annual production of hides and skins are given in tables 1 to 3.

Table 1. Livestock population and available hides and skins, 1975
(In thousands)

Livestock	Population	Available hides and skins		
		Estimated		Rate of annual
		(%)	Total	growth
		(%)		(%)
Goats	1,200	30	360	2
Sheep	800	30	240	2
Camels	140	18	25.2	3
Cattle	80	18	14.2	3

Table 2. Regional distribution of hides and skins
(In thousands)

Livestock	Governorates			
	1st, 2nd, 3rd		4th, 5th, 6th	
	No.	%	No.	%
Goats	144	40	216	60
Sheep	96	40	144	60
Camels	10	40	15.2	60
Cattle	11.4	80	2.8	20

Table 3. Estimated output of hides and skins, unutilized hides and skins and tannery purchases, 1976
(In thousands)

A. Estimated output of hides and skins				
Livestock	Slaughterhouses ^{a/}		Private killing	
	Governorates			
	1st, 2nd, 3rd	4th, 5th, 6th	1st, 2nd, 3rd	4th, 5th, 6th
Goats	53.40	31.45	91.60	184.55
Sheep	29.25	20.70	66.70	123.30
Camels	3.40	1.00	6.60	14.20
Cattle	10.10	0.75	1.30	2.05

B. Estimated unutilized hides and skins			
Livestock	Governorates		
	1st, 2nd, 3rd	4th, 5th, 6th	
Goats		58.3	107.6
Sheep		57.3	39.0
Camels		6.8	15.1
Cattle		7.3	1.3

C. Estimated tannery purchases			
Livestock	Slaughterhouses ^{a/}		Private collectors
	Governorates		
	1st, 2nd, 3rd		Mostly the 5th
Goats	45.74		8.41
Sheep	38.68		5.97
Camels	3.17		0.08
Cattle	4.10		-

^{a/} Excluding kid and lamb skins.

Traditionally, local skins and hides have been used by over a hundred cottage tanneries, each operated by a single craftsman, in the fifth governorate and the old Hadramaut area. Primitive techniques of vegetable tanning are used to make waterbags from skins and sole and sandal leathers from hides. The country's need for leather products, such as western types of footwear, bags, belts and even sophisticated sandals, were met until recently from imports. Local leather manufacturers make some articles from small imports of finished leather.

In 1960, a small private tannery was set up with a few drums and fleshing, shaving, staking, buffing, glazing and embossing machines presumably to manufacture finished leather but actual production was insignificant. The unit remained closed from 1962 till the middle of 1972 when the Government had the machines and equipment repaired and overhauled. More machines were added, the tannery renamed as the National Tanning Factory and it became a state-owned factory. With assistance from the Industrial Development Centre for Arab States (IDCAS), the services of an expert tanner (and, on a temporary basis, six technicians) were obtained for the tannery in September 1972, for a period of about 18 months, to train workers and supervisors and to standardize tannery processes. Since then, the tannery has exported pickled goat and sheep skins and sold to the domestic market different types of finished leather such as resin-finished retan cow and camel hides, sole and lining leather. Annual sales were:

	<u>Pickled export</u> (skins)	<u>Estimated</u> <u>local sales</u> (finished leather)
1973/74	94,860	...
1974/75	47,448	...
1975	79,440	1,800 cow hides 5,000 goat skins 2,300 camel hides 1,400 sheep skins

In view of the local availability of hides and skins and the increasing demand for leather footwear and other leather products, the Government of Democratic Yemen is desirous of maximizing the production of the UNDP/UNIDO assisted Footwear and Leather Goods Centre through the production and supply of finished leather by the National Tanning Factory. As a major step toward input substitution and the build up of a consumer goods industry based on the leather industry, the National Tanning Factory will also meet requirements for finished leather for (a) a proposed state-owned moulded-rubber shoe factory; and (b) cottage and small-scale private industries and also co-operatives making sandals, belts, leather goods etc. This will be achieved through the full utilization of available hides and skins and the improvement of technological, productive and commercial efficiency of manufacturing facilities to cope with this task. Surplus hides and skins are to be processed to obtain maximum profit through export as finished or semi-finished leather.

A. Raw hides and skins

Availability

Goats, sheep and camels are the principal meat-yielding livestock of Democratic Yemen and their hides and skins are by-products of the meat industry. Cattle, also, are bred in certain areas. The goat and sheep population is widely dispersed, mostly in the fifth governorate, the Hadramaut area of the fourth governorate, the sixth governorate and the northern areas. The bedouin population of the eastern governorates and the northern areas is largely composed of wandering herdsmen with flocks of goats, sheep and camels which provide them with milk, meat, a rough carpet wool, and hides and skins. The cattle population is mostly located in the fodder-yielding areas of the second governorate and in some areas of the third governorate. The first governorate is an importer of livestock from other governorates and from overseas to supply meat requirements.

No accurate data are available on the dispersion of livestock, the different breeds, sizes and yields, mating habits and lambing patterns etc. Owing to many historical factors, the livestock generally available are:

Goats. Goats are generally of medium size with a full-grown she-goat at 17 kg and a male goat at 22 kg liveweight yielding an average of 4.0 ft² of skin for all sizes. They are slim and long-legged with a non-fatty body suitable for long trekking and feeding on thorn bushes and soanty vegetation. Most of them are of a local black or brown short-haired Arabian type with about 2-5% of a black, white and light chocolate long-haired type. White, grey and brown East African and Somalian types are also found in some areas. Due to a natural evolution, local breeds or even breeds of foreign origin tend to become thin-skinned and to have a low breeding rate.

Sheep. While 60% of the total numbered small ruminants are goats, 40% are different varieties, mostly non-woolbearing sheep suitable for the trekking and feeding in the desert. From 5% to 10% of the stock have short wool or long hair suitable for shearing. Breeding rate and meat yield are low. The black-head Somalian type yields more meat and correspondingly more square feet of skin. A local sheep of average mix yields about 4.50 ft² of skin.

Camels. Camels are bred and reared mostly by bedouins, as are sheep and goats, and are used as a means of transport in arid regions and also as a source of meat. The breed has a single hump and small stature and yields an average of 22 ft² of skin per camel.

A large part of the population of goats, sheep and camels are reared by nomads. When these animals are killed for meat it is impossible to sell their hides and skins owing to the absence of a buyer. Therefore, the bedouins dry and oil or smoke the hides and skins for their own use and few are sold for any productive use.

Cattle. These are short-statured slim animals found in the second and third governorates where agriculture is at a more advanced level than elsewhere in Democratic Yemen. The average size of the skin is about 19 ft².

Accurate data on the dispersion of various breeds are not available. However, availability of hides and skins is dependent on the following factors:

1. The livestock population, the hides and skins of which are processed commercially as leather.
2. The rate of growth, breed characteristics, breeding habits, animal-rearing environments and the practice of slaughtering animals young enough to reproduce.
3. The rate of slaughter, and the methods of flaying, curing, collection and conservation of raw hides and skins for leather processing.

The livestock population of the country in 1975, according to the Central Statistical Organisation of the Ministry of Planning, was: goats, 1,200,000; camels, 140,000; sheep, 800,000; and cattle, 80,000. The average rate of growth for goats and sheep is 2%, for camels and cattle, 3%. The goat population in Democratic Yemen is 70% in relation to the human population. It is, with Somalia and Ethiopia, among the highest in the world. The next highest being the Sudan at 60%; Turkey at 55%; India at 12%; and then China at 8% (see table 4).

Table 4. Human and livestock populations, 1971
(In millions)

	People	Goats	Sheep	Cattle
China	750	57.5	71.0	63.1
Democratic Yemen ^{a/}	1.7	1.2	0.8	0.08
Ethiopia	2.6	11.3	12.8	26.3
India	570	68.0	42.8	176.0
Somalia	3.5	10.0	6.0	2.5
Sudan	16.1	10.1	13.2	13.6
Turkey	35	19.5	6.5	12.8

^{a/} For 1975.

Goats and sheep are the main source of subsistence for the population living in the northern areas and a large part of the eastern governorates. Since the economic employment pattern of the population may not change drastically for some time in the arid and remote areas, it is likely that current ratios will be maintained. About 60% of goats and sheep are located in the eastern governorates (fourth, fifth and sixth) and the northern areas. The domestic rearing of goats and sheep would decrease with any basic change in the agricultural or economic employment pattern.

Because of inadequate feed, protracted milking, forced stoppage of insemination and environmental influences, the breeding average per year is one kid per goat. The yearly net yield of meat and skins from the total population of goats and sheep is 60% in India and Pakistan, 40% in Nigeria, 30% in Tanzania etc.; in Democratic Yemen, the estimated minimum annual yield is 30%. This figure could be improved through the education of bedouins and villagers in animal husbandry, planned culling of non-reproductive and defective stock, and so on.

The cattle population has remained minimal owing to a variety of conditions such as the limited scope for farming cattle fodder and inadequate investment in cattle ranching. Meat yield, as a percentage of the total cattle population, varies greatly in different countries from about 47% in Poland and other centrally planned economies, about 40% in the Federal Republic of Germany and the United States to about 10% in India. In Democratic Yemen the estimated meat yield from cattle - obtained mostly through state-owned co-operative slaughterhouses - is 18%. The meat yield from camels is also 18%. This figure could be raised quickly to 25% by improvements in planned breeding, feeding and culling for slaughter.

Hides and skins are mostly available through state-owned co-operative slaughterhouses in the first and third governorates. Although no specific data are available, private kills are certainly high in the fourth, fifth and sixth governorates and in the northern areas where yield of meat and skin is a means of subsistence. However, there is a very low yield of hides and skins from these areas as collection is made infrequently by private buyers and, so far, the tannery has been unable to organize any direct purchases. (See table 5 for the estimated yield of hides and skins as a percentage of the livestock population.)

Table 5. Estimated yield of hides and skins as a percentage of the livestock population, 1976 a/

	Estimated		Possible	
	%	No.	%	No.
Goats	30	360,000	40	480,000
Sheep	30	240,000	40	320,000
Camels	18	25,200	20	28,000
Cattle	18	14,200	20	16,000

a/ 1975 figures have been used in order to arrive at a conservative estimate.

The slaughter of sheep includes 49% of lambs and that of goats includes 40% of kids. The large-scale slaughter of female livestock of reproductive age was evident to the expert during his visits to slaughterhouses, in spite of the fact that there are government orders against such slaughter. Effective steps are required to stop such practices and to introduce planned slaughter.

In tannery classification, skins above the size of 2 ft² are not considered as kid or lamb. Skins which are so classified are not processed in the tannery owing to the lack of commercially economic volume and specialized machines required for the manufacture of glove or fur leather.

Tannery purchases of air-dried and dry-salted skins were from the fifth governorate whereas green hides and skins were from the first, second and third governorates. Almost the entire quantity of goat and sheep skins, excluding kid and lamb skins below 2 ft², were from the first, second and third governorates.

Skins from the fifth governorate are generally badly cured and have grain damage, putrefaction etc. These faults are only detectable after the initial tannery processes.

Raw skins from the private killing of goats and sheep total approximately twice the output of slaughterhouses in the first, second and third governorates and at least four times the output of slaughterhouses in the fourth, fifth and sixth governorates and the northern areas.

The tannery purchases almost all available skins from slaughterhouses in the first, second and third governorates and a few skins from the fifth governorate offered by private collectors (see table 6). The camel hides offered

by slaughterhouses of three governorates are also purchased by the tannery. The cattle hides available in the second and third governorates are not all purchased by the tannery, perhaps because of a lack of processing capacity and the uncertain quality of curing in the second governorate. Current production, based on 1975 figures and present turnover, is barely 450 skins and 25 hides per day owing to such factors as: (a) lack of machines, equipment, space and no proper maintenance of available machines and equipment; (b) absence of tanners; and (c) absence of any management plan, systems control, production plan or cost allocation and controls. Because of these difficulties, achievements in current production and exports are made by only a few devoted individuals at a high cost in production capacity and much wastage.

Table 6. Consumption of goat and sheep skins, 1975
(In thousands)

	Tannery	Foreign trade export	Cottage tanners	Total
Goat skins	54	37	100	191
Sheep skins	45	38	100	183

A shortage of raw hides and skins due to inadequate local procurement arrangements will have to be met by imports. Skins from Kenya or Somalia and hides from Ethiopia, Kenya and Somalia are suitable but owing to a constant increase in demand and attempts in these countries to develop domestic processing facilities, imports of raw hides and skins will prove increasingly uneconomical. In case of a shortage, efforts should be made to obtain Somalian and Kenyan camel hides to meet the leather requirements of the local market as these will be cheaper than other hides and skins.

Recommended quality improvements

The breed, sex and age of livestock are generally the determinants of general characteristics such as hide substance, compact, loose or spongy fibres, fine or coarse grain and hump or growth marks. Generally, the hide substance of local raw material is uneven for cattle and camel, and both goat and sheep skins tend to be thin. Wrinkles are common in all types of skins but grains are medium fine in goat and cattle, offering scope for grain-finished leather if other defects are minimized through the efforts of the animal husbandry

authorities. Seasonal variations in hide substances or fat content, typical in extreme climates, are not visible in Democratic Yemen except in the 5%-10% of the sheep population which are woolbearing and graze in the higher altitudes.

Ante-mortem defects

Sores, pox, ticks, scabies and other infections due to poor general conditions and health care facilities, hard work, malnutrition etc., give rise to rib marks, certain types of vein marks and wrinkles. Branding should be located as near to the knee-caps as possible to reduce the loss of usable areas. Considering that finished goat or sheep leather should sell at almost \$1/ft², it would be beneficial if identity discs or some other method could be substituted for branding.

Post-mortem defects

The tannery, though unable to control ante-mortem defects, could reduce flaycuts made in slaughterhouses and even in the private sector. Unhygienic conditions of slaughter, the practice of using pulled skins for carrying offal and intestines to market, inadequate washing and curing practices, all cause such bacterial growth as hair slip and grain damages through putrefaction. Drying skins by placing them on the ground or on rooftops in direct sunlight, as practised widely, even by the tannery, causes hardening of the surface and allows the captive humidity in the middle layer of the skin to cause bacterial growth. Harsh sunlight may also cause the skin substance to gel.

In parts of Africa, such as Kenya, Nigeria, Uganda - and even Somalia where it is uneconomical to use salt as a curing agent - hides are dried in the shade on frames at a 45° angle. Skins can be put on a drying wire in the shade as frame-drying changes their shape and characteristics. In all areas, government authorities and buyers can help to change methods of flaying and curing, even in cottage practices.

Flaycuts deplete the value of goat and sheep skins by about 5%, cattle hides by about 25% and camel hides by about 35%. The pulling of sheep and goat skins, initial ripping at the butt and the practice of ripping the legs, cause flaycuts; in the case of cattle and camel hides damages are severe.

The marketing expert, during visits to slaughterhouses in Aden and in Mukalla, attempted to introduce rounded knives for flaying. His counterpart, the tannery manager, is actively following-up this measure by modifying locally-

available knives. However, in order to bring any rapid and sustained change in the practice of flaying, it will be necessary to obtain the services of an expert who could actually work with flayers in slaughterhouses and even in important village centres, to demonstrate methods of flaying and to introduce improved knives, hangers etc.

In flaying centres, it is essential to organize a copious flow of clean water for the immediate and thorough washing off of blood, dirt and sinews after the flaying of hides and pulling of skins. It was satisfying to see the cottage tanners at the seashore on the outskirts of Mukalla utilizing plenty of sea water to clean their hides and skins. Private collectors use little water and it seemed to be dirty and contaminated.

Large crystals of salt and contaminated salt currently used for curing should be replaced by medium-ground clean salt available at a cheap price (3-6 fils/kg).

If private collectors continue to clean, cure and store hides and skins they should provide themselves with well-ventilated clean sheds with a sufficient water supply and drainage facilities.

Curing methods

In a small country, where hides and skins can reach the tannery, even from distant places, within a period of six to eight weeks after flaying and curing, it is not essential that the cured hides and skins should be dried, causing additional problems for the tannery processing. Even the skins originating in desert areas, which have to be dried (in the shade) because of infrequent collection from remote areas, can be immediately soaked in detergent at the procurement centres and treated with salt and bactericides to convert them to wet/salted.

Properly cured wet/salted hides or skins can be safely stored in the shade for about three to four months. However, they will require shifting and repiling every 10 days to avoid heat generation. To improve salt curing, about 0.1% of soluble types of bactericides should be mixed with the salt.

Once the centre has accumulated a full truckload, it should immediately be transferred to the raw store of the tannery for selection of sizes, quality grades etc.

Arrangements for the procurement of hides and skins by the tannery are as follows:

(a) Hides and skins from surrounding co-operative slaughterhouses are collected by the tannery and then washed and cleaned. If these are not immediately required for soaking in the tannery, they should be cured and stored in the raw store;

(b) The tannery has a buying and curing centre at Abyan in the third governorate to buy fresh hides and skins from the local slaughterhouses and dry/salted skins from private collectors;

(c) Private collectors from other governorates deliver their goods directly to the tannery dry/salted and, in rare cases, air-dried;

(d) An employee from the tannery selects goods from private collectors and prices are paid according to weight for cattle hides and to size for sheep and goat skins. There are different prices for the same size and quality of green, dry/salted or air-dried hides and skins (see tables 7 and 8);

(e) Size grouping leaves gaps for the categories 60-70 ft²/dozen skins and 40-50 ft²/dozen skins; neither category is classified in raw sizes or in pickled exports. Skins in these two categories are therefore placed in bigger or smaller sized categories.

Table 7. Current prices and grades for hides and skins

Area/dozen	Quality	Somali <u>a/</u> Democratic Yemen	
		<u>_____</u>	Fils <u>a/</u> <u>_____</u>
<u>Sheep and goat skins</u>			
Green			
70-75 ft ²	1st, 2nd, 3rd	250/skin	
50-60 ft ²			
50-60 ft ²	1st, 2nd, 3rd, 4th	135-150/skin	
30-40 ft ²		87.5/skin	
20-30 ft ²	1st, 2nd, 3rd	100/skin	
Dry/salted			
70-75 ft ²	1st, 2nd, 3rd, 6th	225/skin	
50-60 ft ²	20 30 40 10		
50-60 ft ² or higher	20 30 40 10	-	150/skin
30-40 ft ²	20 30 40 10	-	87.5/skin
Air-dried			
120 lb or more per 100 pieces	10 30 40 20	-	250/skin

Table 7 (continued)

Area/dozen	Quality	Somali	Democratic Yemen Fils a/
<u>Cowhides</u>			
	Green (cow and calf)		20/1 lb
	Dry/salted: cow		1,500-2,000/28 lb
	calf		2,000-3,000/28 lb
<u>Camel</u>			
	Green		100/piece
	Dry/salted		300/piece
<u>Camel neoks</u>			free

a/ 1,000 fils = 1 YD.

Table 8. Analysis of current purchases

	lb/ piece	Average (lb)	Fils/ piece	Ft ² / piece	Ft ² / lb	Fils/ ft ²	
<u>Cattle hides</u>							
Green							
(20 fils/lb)	Heavy	Above 30	35	700	28	0.8	25.0
	Medium	20-30	25	500	22.50	0.9	22.2
	Light	10-20	15	300	15	1.0	20.0
	Calf	Below 10	6	120	7.5	1.25	16.0
Dry/salted							
(53.6 fils/lb)	Heavy	Above 15	17.5	938	28	1.6	33.5
	Medium	10-15	12.5	670	22.50	1.83	29.80
	Light	5-10	7.5	402	15	2.29	26.80
	Calf	Below 4	3	1,500	7.50	2.69	10.0
Per piece 75							
			<u>Ft²/piece</u>	<u>Fils/piece</u>	<u>Fils/ft²</u>		
<u>Camel hides</u>							
	Slaughterhouse		21.6	100		4.63	
	Dry/salted		21.6	300		13.90	

Regrouping of sizes and their current price structures could be as below for both goat and sheep skins:

<u>Ft²/dozen</u>	<u>Fils/skins</u>		
	Average ft ²	<u>Grades</u> 1st, 2nd, 3rd	4th
Above 70	6.25	190	85
50-70	4.75	150	75
30-50	3.25	100	50
20-30	2.50	75	37

The maximum possible average price of 246 fils/raw skin of average size and quality would be feasible if production facilities were improved.

Goats and sheep in the size range of 20-30 ft²/dozen should not be slaughtered thereby ensuring a higher average of meat or larger sizes of skins per animal.

The estimated availability of, and procurement capacity for, raw hides and skins are shown in table 9.

Table 9. Estimated availability of, and procurement capacity for, raw hides and skins (In thousands)

Livestock	<u>Availability of hides and skins</u>		<u>Procurement capacity</u>		
	Total	<u>Slaughterhouses</u> Local	<u>Slaughterhouses</u> Imported a/	Local	<u>Private kills</u> Local
1977					
Goats	360.0	84.85	55	46	6
Sheep	240.0	49.95	45	38	9
Cattle	14.4	10.80	-	10.1	-
Camels	25.2	8.50	-	5.4	-
1978					
Goats	367.0	87.0	55	73	50
Sheep	245.0	60.0	45	60	40
Cattle	14.8	11.1	-	10.8	1.0
Camels	26.0	6.7	-	5.4	1.0
1979					
Goats	375.0	90.0	55	78	112
Sheep	250.0	64.0	45	64	88
Cattle	15.3	11.4	-	11.3	2.0
Camels	26.7	6.9	-	6.4	2.0

Table 9 (continued)

Livestock	Availability of hides and skins		Procurement capacity		
	Total	Slaughterhouses Local	Slaughterhouses Imported a/	Local	Private kills Local
1980					
Goats	382.0	93.0	55	82	120
Sheep	255.0	68.0	45	68	96
Cattle	15.8	11.8	-	11.8	2.5
Camels	27.5	7.10	-	6.5	3

a/ Hides and skins from imported stock.

B. The establishment of procurement centres

Three supervisors should begin training immediately for a period of six months, in grading, sorting and curing of hides and skins in the raw hides stores of the tannery where the minimum required standard of know-how is available. Procurement centres can then be opened at Mukalla and Seiyun in March 1977 and Lahej in 1978.

Six workers should begin training for a period of three months in cleaning, salting, piling etc. of hides and skins. Two trained workers should then be sent to each of the procurement centres to clean, cure, and store hides and prepare them for transport to the tannery when truckloads are accumulated.

The cost of operation in each procurement centre would be as follows:

	<u>YD/month</u>
Supervision for grading, sorting procurement and controlling hides and skins	40
Two workers to clean, cure, store, handle etc.	50
Allowances, contingencies, rent etc.	85

The proposed centres in Mukallah and Seiyun, through the active co-operation of private collectors, can obtain skins from neighbouring areas not covered by collectors for the slaughterhouses. Table 10 shows the estimated annual targets for the centres. By providing the incentives of prompt payment on inspection, higher prices for better skins etc., collectors can be induced to work full-time rather than part-time in the collection of hides and skins thereby covering more areas and intensifying collection in the areas now covered. This would avoid the delay in collection that results in bacterial growth and putrefaction.

Table 10. Estimated annual targets for the procurement centres
in Mukalla and Seiyun
(In thousands)

	1977	1978	1979
Sheep skins			
Slaughterhouses:			
Imported livestock	45	45	45
Local:			
First, second and third governorates	38	40	42
Fourth, fifth and sixth governorates	20	20	22
Private collectors	<u>2</u>	<u>40</u>	<u>88</u>
Subtotal	112	145	197
Goat skins			
Slaughterhouses:			
Imported livestock	55	55	55
Local:			
First, second and third governorates	46	48	50
Fourth, fifth and sixth governorates	25	25	28
Private collectors	<u>6</u>	<u>50</u>	<u>112</u>
Subtotal	<u>132</u>	<u>178</u>	<u>245</u>
Total	244	323	442
Cattle hides			
Slaughterhouses	10.1	10.8	11.3
Private	<u>...</u>	<u>1</u>	<u>2</u>
Total	10.1	11.8	13.3
Camel hides			
Slaughterhouses	5.4	5.4	6.4
Private	<u>...</u>	<u>1</u>	<u>2</u>
Total	5.4	6.4	8.4

The minimum and maximum costs of procurement of skins in Mukalla and Seiyun are shown in table 11. There will be a further reduction in costs through an increase in the collection of camel hides.

Table 11. Estimated yearly turnover and costs of skins in Mukalla and Seiyun

	Mukalla		Seiyun	
	Slaughterhouse	Private	Slaughterhouse	Private
A. Turnover				
Sheep skins	8,400	33,600	12,000	48,000
Goat skins	<u>9,000</u>	<u>36,000</u>	<u>12,000</u>	48,000
Total	17,400	69,600	24,000	
Cost of centre (YD)	2,100		2,100	
	Maximum cost	Minimum cost	Maximum cost	Minimum cost
B. Costs	<u>(Fils)</u>	<u>(Fils)</u>	<u>(Fils)</u>	<u>(Fils)</u>
Per skin	120	25	88	17.5
Salt, bactericides etc. per skin	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>
Total	125	30	93	22.5
Per ft ²	30	7	23	5

The maximum cost in the case of procurement only from slaughterhouses would be 125 fils/skin in Mukalla and 93 fils/skin in Seiyun; these prices may go down to 30 fils and 22.5 fils respectively. The current average price of procurement from collectors from the fifth governorate is 135 fils per skin with a loss in quality and quantity through putrefaction. The exact loss could not be ascertained because of a lack of data. However, out of 80,790 local sheep skins and 69,370 local goat skins processed by the tannery about 35,000 skins (43%) and 23,850 skins (34%) respectively were factory rejects. Of these, 30% were rejected due to bacterial degeneration while the balance had ante-mortem defects such as pox, scabies, thorn and sore marks and thin substance.

Improvements in cleaning, clearing and storage, with trained personnel to do the curing, could increase the value of skins by 25%. With a maximum additional cost of 125 fils/skin, the average price for raw skins would be 260 fils/skin which is the cheapest current price for comparable quality, for instance, air-dried skins with similar ante-mortem defects cost 400 fils in Kenya, Rawanda, Somalia etc. Therefore, even at the maximum collection cost

of 60 fils/ft² the procurement centres could provide a competitive source of raw material to process as vegetable tanned or wet blue semi-processed or finished leather. The benefits in setting up the procurement centres would be:

- (a) The saving of foreign exchange in direct ratio to the increase of local skins;
- (b) The increase of available resources from avoiding wastage;
- (c) The increase in value of improved raw resources.

In addition to setting up new procurement centres at Mukulla and Seiyun, it would be necessary to strengthen the present centre at Abyan with an improved water supply, drainage, an inclined platform for salting and piling etc., and a supply of finely-ground salt and bactericides. Depending on the tannery's ability to manage the proposed new procurement centres, a similar centre is recommended for Lahej to augment the supply of cattle hides and improve flaying and curing deficiencies in that area.

Subject to the availability of raw skins and hides organized through the proposed procurement centres, production capacity in the tannery can be increased to the levels shown in table 12.

Table 12. Projected production capacities for the tannery
(Units in thousands)

	Unit	1977	1978	1979	1980
Domestic market					
Upper leather	ft ²	242	395	522	666
Lining leather	ft ²	58	80	122	239
Sole leather	lb	33	38	56	70
Garment leather	ft ²	10	10	10	10
Chamois leather	ft ²	5.3	6.1	6.9	8
Export market					
Retan leather	ft ²	15	41	53	65
Lining leather	ft ²	25	35	45	344
Chamois leather	ft ²	10	13	18	23
Garment suede leather	ft ²	39	49	179	221
nappa leather	ft ²	...	...	74	91
Fancy leather	ft ²	...	...	0	324
Vegetable crust	ft ²	...	...	68	240
Pickled skins	Pieces	190	162	62	67
Glacé kid	ft ²	...	...	...	108

When minimum production goals have been achieved in the tannery, low quality skins and even hides can be made into footwear components either in the existing shoe factory or in a new unit of production. Footwear components from cheap or standard quality of upper leather are already being bought from developing countries by Bulgaria, France, the German Democratic Republic and the United States. Long-term collaboration can be sought for such export lines, based on the quantity of surpluses.

C. Short- and long-term marketing plans

The domestic market

In Western Europe, 60%-70% of finished leather is used in the production of footwear and the rest for garments and goods, such as, handbags, purses, belts, travel goods, sports goods etc. In Democratic Yemen, about 95% of finished leather is used in the manufacture of footwear. Consumption of finished leather is dependent on the population, its growth rate, the consumption capacity at different levels of income and occupation and the footwear-wearing habits of the country.

Due to economic constraints, tropical climate, and low rainfall, the percentage of footwear consumption is generally low in Democratic Yemen (see table 13) with an average consumption of one million pairs per year.

Table 13. Consumption of footwear and leather goods in Democratic Yemen

	Unit	1972	1973	1974	1975
Imports					
Leather footwear with plastic/rubber soles	Pairs	112,788	111,704	84,232	24,273
Other footwear	Pairs	...	...	145,360	393,840
Travel bags etc.		...	...	6,876	389
Domestic production					
Plastic sandals	Pairs	...	201,952	357,547	590,142
Leather footwear	Pairs	...	...	...	20,364
Fabric belts with leather pocket		...	...	...	15,592

Leather shoes and sandals etc. are made of leather uppers with soles of rubber, polyvinylchloride (PVC) or leather. Non-leatner shoes are generally made from PVC, leather cloth uppers with rubber soles, foam-rubber (sandals) or canvas-rubber (shoes and sandals).

Consumption seems to fluctuate considerably. This may be due to incomplete data for cottage industry sales and the co-operative production of leather and non-leather sandals. Consumption of leather footwear should go up in relation to the increase in local production, provided prices are reasonable. The Demonstration and Training Centre for Leather Footwear and Leather Goods operating in Aden with UNIDO assistance is beginning to produce a fair quantity of goods.

While the rate of growth in population is estimated at 2.7% in the current five-year plan, the annual rate of growth of consumption of footwear is estimated at 5% because of the general drive toward a better standard of living (see table 14).

Table 14. Estimated footwear consumption, 1976-1980
(In thousands)

Year	Population projection	Non-leather footwear	Leather footwear
1976	1,723	860.1	180.6
1978	1,817	948.3	199.6
1980	1,920	1,047.5	220.3

The Government is considering setting-up and running a moulded-rubber shoe manufacturing plant by the middle of 1978 with a annual capacity of 300,000 pairs, half of them of leather. Therefore, the approximate requirements of finished leather for all sectors, inclusive of the belting factory and cottage and co-operative units for the manufacture of sandals, will be as shown in table 15.

Economic production in the moulded-rubber unit would require unlined shoes and boots for which leather requirements would be from 1.5 to 1.6 mm thickness for boys' footwear and from 1.75 to 2 mm for men's footwear. For heavy duty unlined boots, requirements would be from 2 to 2.5 mm of printed leather. There would be a marginal requirement of lining leather.

Table 15. Estimated requirements for finished leather, 1977-1980
(In thousands)

	Unit	1977	1978	1979	1980
Shoe factory:					
Upper leather	ft ²	170	227	227	284
Lining leather	ft ²	40	54	54	68
Soles	lb	20	27	27	34
Moulded-rubber shoes:					
Upper leather	ft ²	...	90	210	270
Lining leather	ft ²	...	4	10	13
Belting factory:					
Woven uppers		36	39	42	45
Co-operatives and cottage units:					
Upper leather	ft ²	36	39	42	45
Lining leather	ft ²	18	19	21	22
Sole leather	lb	18	19	21	22
Miscellaneous:					
Garment leather		10	10	10	10

The belting factory needs from 2 to 2.5 mm chrome retan corrected leather from cow or camel hides with a marginal requirement of 1.7 mm leather. Consumption per belt has been estimated at 0.5 ft² for pockets and end insertions.

The extent of a deficit or surplus of leather on a day-to-day basis, would depend entirely on the factory's technical and management efficiency in planning, programming and process controls.

The introduction of a 600-ton embossing machine would enable hides of defective grain and substance to be used for printed grain, or other prints, instead of the present practice of making a surplus of sole leather. Such prints could be used in case of a shortage of upper leather.

There is a lack of control in process adjustments, even in day-to-day processing and there is an immediate need for a senior tanner and three shop technologists: (a) to standardize the processes; (b) to maintain process standards; and (c) to train supervisors for a lime and tan yard, a shaving, dying and setting yard and a finishing yard.

A normal marketing operation would require booking orders on the basis of tannery capacity with accurate forecasts of actual turnover. The tannery would therefore require an efficient planning and control section for (a) the continual assessment of capacity; (b) the planning, in co-ordination with the Sales Section, of current and probable commitments and opportunities; (c) the preparation of a suitable "mix" of orders for the best utilization of production facilities, raw material and chemicals; and (d) the issuance of job or lot cards indicating the size-mix of raw hides and skins, the target quantity and types of finished leather required to fill an order.

A cost forecast should be prepared for each product line and a check system introduced in raw processing and finishing to observe cost fluctuations.

Marketing operations are weakened if projected output does not materialize owing to breakdowns, lack of raw material and chemicals etc.

Elaborate pre-costing or cost forecasting is necessary for a pricing policy, based on costs, quality and demand.

At present, requirements for shoe and belting factories are being met directly from the factory. The co-operatives and private cottage sectors for footwear obtain their supplies from the tannery stores at Aden. The shoe factory enjoys the benefit of a 10% discount for their supplies from the tannery, creating a pricing anomaly disadvantageous to co-operatives and the cottage sector. Cottage sandal manufacturing units in the fifth governorate have also to bear costs of travel and transport when obtaining goods from the store at Aden. Uniformity in pricing policy could be ensured by:

(a) Offering a uniform discount of 5% on all sales, either from the tannery or their store at Crater;

(b) The main market for vegetable tanned soles and lining is in the fifth governorate. A retail store should therefore be established in Mukalla, either by the tannery or through an agent, with an ex-tannery discount of 10%.

Tinted cow lining, printed finished linings and split suedes can be made into leather bags, seat covers, purses etc., as there will be an excess of such materials in 1980. These can be sold in international markets.

The export market

While basic global resources, i.e., livestock population, are developing at the annual rate of about 2%, the demand for leather products and of finished leather is developing at an over-all rate of 5% owing to (a) the increase of

market demand in newly-developed and developing countries; (b) the increase in the standard of living in high consumption areas; and (c) natural market expansion through growth in population.

From 60% to 70% of the leather consumption in Western Europe and the United States is for footwear and the balance is for leather garments, bags, purses, gloves etc. The market for leather garments goes through periodic changes, with high demand for two or three years and low demand for the next two years depending on the fashions. Leather garments have had good sales for the last three years except for a temporary lull due to price undercutting from a few countries resulting in a general loss to the manufacturing and distribution system. Similarly, a sudden depression in the consumer market created chaos in the footwear industry and tanneries in Western Europe, with a drop of about 20% in the consumption of high-priced leather footwear. Supplies from competitive sources, i.e., Brazil, Czechoslovakia, Hungary, India etc., did not diminish as consumers bought cheaper shoes of reasonable quality and design.

The low supply of hides and skins and constant increases in leather consumption have kept prices increasing for raw and finished leather in Western Europe during the last three years. Following are some of the examples based on average import prices and their relevant qualities (cent/ft²).

	1973	1974	1975	1976
Glacé kid and aniline goats	1.10	1.30	1.70	1.90
Cow uppers, semi-aniline	0.60	0.75	0.90	1.10
Tinted cow lining	0.30	0.35	0.45	0.55

European tanneries generally prefer exclusive terms to ensure that the supply line is dependable. As prices and costs fluctuate widely in the raw market, which fluctuations are reflected in the finished price, it is advisable for the tannery to retain an option in long-term contracts for the re-negotiation of prices at least every three months. Quantities committed in long-term contracts should be realistic in terms of monthly or periodic deliveries.

Amount of exportable surplus

Deciding upon the amount of export surplus is a continuing process depending on the availability of raw materials, processing facilities, restrictions, commitments for the domestic market and the advantages of export. National

policies regarding conservation of resources and foreign exchange earnings differ from country to country. Countries such as Argentina, Brazil and India discourage export of raw hides and skins and encourage, through fiscal measures and incentives, the export of finished leather and products such as footwear, bags, garments. Exportable surplus therefore can be expressed in terms of raw, semi-processed and finished leather, as products, or as pieces of pickled or wet blue.

In offering products for export, the tannery would have to ascertain that:

- (a) Raw materials and chemicals are available in the required quality, sizes etc., at competitive prices;
- (b) Processes are standardized and satisfactory for a competitive market in terms of quality, cost and monthly volume of production;
- (c) Shifts in the policy of procurement of raw hides and skins and of mechanization progress according to schedule;
- (d) Neither overselling nor underselling tannery capacity occurs.

Failure to keep commitments to importers as to quality, delivery and price causes hardship, loss of face and often stiff penalties or the loss of goodwill and markets. The tannery should, therefore, introduce system controls on (a) the planning of the quality and volume of raw materials and chemicals according to sales; (b) production programming, job or lot controls; (c) pre-costing and post-auditing; and (d) a preventive maintenance programme and stores inventory.

The tannery has serious deficiencies in all these aspects of system controls and consequently suffers frequent breakdowns, processing disturbances and fluctuations in quality and costs which reflect directly on cost competitiveness.

Trade barriers

There are certain import restrictions imposed by Western European and other countries on finished leather and leather products, whereas policies are somewhat liberal for the import of raw hides and skins or semi-processed leather.

Spain provides incentives for the re-export of leather and leather products. Incentives are also given by India and Italy and even higher ones by Argentina, Brazil and Pakistan, for the export of finished leather and leather products.

It is essential to reach the principal world markets - Europe, Japan, the Union of Soviet Socialist Republics and the United States - as economically and speedily as possible. It is recommended that pickled or wet blue skins be

exported by sea. As market preferences are stable in the basic sizes and qualities of semi-processed materials, and as weight per square foot is heavy, importers prefer to have both raw and semi-processed skins by air freight.

Crust leathers (i.e., after fat-liquoring, setting, drying and staking) and finished or "ready to finish" leathers are comparatively light-weight and there are constant market shifts in process specialities and colours, therefore importers place orders on the basis of actual requirements and they are delivered by airfreight. Usually, once a buyer has gained confidence in the products and efficiency of a tannery, bulk orders are placed for individual processes such as glacé kid, aniline, semi-aniline etc. Shades are communicated by the buyer, from time to time, by cable according to market preferences. Prices for such bulk orders are re-negotiable periodically, if provided in the contract or order.

Airfreight rates

Airfreight rates from Aden for crust and finished leather have not been established by the International Air Transport Association (IATA). In the absence of IATA rates, goods will have to be airfreighted by general cargo rates which are considerably higher and uneconomical. ALYEMDA, the national carrier, is a non-IATA airline and has no flights to the principal buying countries. Air carriers (IATA members) flying passengers and cargo through and from Aden are: Egypt-Air, Air-India, East African Airways and Saudia. Booking arrangements may also be made with Air France, Kuwait Airways and Pakistan International.

The tannery should immediately request one or more IATA airlines to file commodity rates with IATA for finished leathers and ready-to-finish leathers. Rates are cheaper for higher loads of a single consignment, i.e., 1,000 kg or over (or 1,500 kg or over) with a higher rate per kg for 500 kg, 100 kg, and so on. Rates should be filed for one ton or over, mentioning that finished leather is non-perishable, non-breakable and non-bulky. From India airfreight rates to New York are:

	<u>Average area/kg</u>	<u>Airfreight rates cent/ft²</u>
Glacé kid	18-20 ft ²	7 ¢
Semi-chrome goat, 1.1 mm	14 ft ²	10 ¢
Goat lining, 0.8 mm	17 17 ft ²	8 ¢

Airfreight costs to Europe would be about 50% of the above. Transshipment through Kuwait or Cairo would be cheaper, once the bulk rate has been established.

Since 1973, pickled skins have been shipped by the tannery. Freight rates increased dratically since the closure of the Suez Canal and the increase in the price of fuel. Freight rates from Aden Port are as follows:

<u>Destination</u>	<u>\$/ton</u>
Genoa	192.09
Marseille	192.09
Hamburg	163.94
Liverpool	163.94

Freight rates are similar for finished leather. Ships are generally available in Aden because of bunkering facilities, and particularly since the re-opening of the Suez Canal. About two boats a month are available for Western European ports. As the tannery is situated within six miles of the port, pre-shipment warehousing facilities are not necessary.

Sales policy and contracts

In view of the small quantity involved, direct contact should be established with the tanneries in Europe, Japan and the United States which are the recipients of pickled skins. This would permit a price advantage and improved communications on quality requirements.

Various sales contracts may be suitable for the tannery, as follows:

(a) Offers to individual buyers, through correspondence, visits by a tannery representative or visits by buyers. These offers should include samples and f.o.b. prices;

(b) Bulk order negotiation for a long period, six months to a year, with specific agreement on quality, monthly deliveries, mode of inspection and payment;

(c) Long-term agreements can be entered into with reputable buyers in Europe, Japan and the United States involving:

- (i) Flaying, curing and collection of hides and skins;
- (ii) Export of kid and lamb skins;
- (iii) Standardization of processes and financial collaboration for appropriate mechanization;
- (iv) Marketing of exportable surplus;
- (v) Training of personnel.

Countries such as Czechoslovakia, Romania, the USSR and Yugoslavia, operate in developing countries with some form of technical and marketing collaboration, supply of machines and equipment etc. There are also interested buyers or collaborators in France, Italy and the United Kingdom.

In specific cases of export marketing collaboration, where techno-economic management is of a joint venture with foreign collaborators, the Government may consider setting up an expanded programme in secluded areas such as the Caltex pier or the Mansura Industrial Area.

Export pricing policy

The price structure for finished leather fluctuates considerably. A 5%-10% mark-up on f.o.b. prices would be a reasonable profit margin for individual product lines. In particular cases where a continuing long-term export programme is assured, it would be economical to agree to a lower margin in view of the savings in sales promotional costs, setting-up costs in product line changes etc.

A revised list, with prices 20%-60% higher than the old one, was suggested by the marketing expert. These upward price revisions are in line with market prices and are generally acceptable.

By 1980, there will be a considerable production surplus. Vegetable tanned, chrome retan or semi-chrome goat and sheep skins of lower qualities can then be suitably finished in protein or resin as aniline or semi-aniline for the woven uppers of leather shoes or normal shoe uppers for shoe companies in Europe, Japan and the United States. The capacity for such a programme can be included in the footwear centre or it could be a new project with a minimum of machinery and equipment, such as sewing machines of various types, band-knife splitting, skiving, which are not very expensive. A project of this type can best be undertaken as a sub-contract from a shoe factory having a common production programme, a smooth flow of components by airfreight, a periodic change of patterns because of shifts in the market, the provision of patterns and technology by the parent factory, a mutual exchange of technical information and personnel on a regular basis and so on. Component manufacturing on a sub-contracting basis has been successful in India, Mexico and Yugoslavia. Bulgaria, France, the German Democratic Republic and the United States are already operating such programmes. The selection of sub-contracting partners is usually done with extreme caution on both sides to ensure long-term success.

In the interest of developing the export market for finished leather and leather components for footwear, the tannery and footwear unit should be one commercial operation under common management.

II. CONCLUSIONS

1. Certain basic data is unavailable such as analyses of breeds, animal husbandry, breeding and distribution of livestock in different areas, and of income groups and their consumption of leather. Data on the livestock population and the annual production of hides and skins are shown in tables 1 to 3.
2. A high incidence was noted of the slaughter of lambs, kids and cattle of reproductive age in slaughterhouses. This would also be the case in private household killings.
3. Goats, sheep and camels are the principal means of subsistence in many households in desert and remote areas. There is a need for improvement in breeds, health care, breeding practices etc., to improve the yield of meat and the size of skin per head. Pox, scabies, thorn and sore marks etc., and thin substance occurring widely in goat and sheep skins require remedial measures in animal husbandry.
4. Post-mortem defects such as flayouts during slaughter and bacterial degeneration due to the wrong methods of curing and storage, reduce the value of cattle hides by 30%, camel hides by 50% and goat and sheep skins by 30%.
5. Skins imported from Somalia are well-cured and of good quality. The quality of pickled skins for export is substantially improved owing to the general practice of mixing Somalian and local skins.
6. Imported Australian sheep skins, particularly those available from slaughterhouses, have little or no value as leather, not even as lining. These would fetch, at most, only 50% of their cost after tannery processing, owing to heavy fat pockets, growth marks and careless damage to the skin by Australian shearers during dewooling prior to shipment.
7. Processing and process control efficiency in the tannery is low owing to the absence of a shop-floor tanner and senior leather technologists. Machine breakdowns occur daily causing changes in the quality of chemical operations. Some of the deficiencies in control are the mixing of different sizes and weights in common lots, variations in dilution, temperature, and weights, absence of preplanning etc.
8. Product-mix, i.e., the final output, is not preplanned. Quality or cost behaviour of individual lots cannot be assessed due to the lack of a system.

9. There is also a lack of a marketing plan or a cost or output forecast which is necessary for the efficient running of internal or export market operation.

10. A common approach toward a production programme to increase leather utilization by the shoe factory and the tannery is totally lacking.

11. The pricing policy for domestic markets is not uniform. The shoe centre receives leather at a 10% discount. Cottage manufacturers of sandals from other governorates incur the additional expenses of travel and transport of goods when they procure leather from the Aden leather store of the National Tanning Factory.

12. Indirect contact with overseas markets through intermediaries increases costs paid by the tannery.

13. The present cost of marketing or of market promotion for export is minimal.

14. The tannery makes no plans for its day-to-day functions and programming, or for achieving its long-term objectives.

III. RECOMMENDATIONS

1. Centres for the procurement of hides and skins should be opened, initially at Seiyun and Mukalla and later at Lahej.
2. The services of a flaying expert should be obtained to demonstrate in slaughterhouses and to private butchers the correct method of flaying and to introduce an improved, rounded type of flaying knife.
3. Reclassification of skins should be made to include the sizes 40-50 ft² and 60-70 ft².
4. Pending completion of a training programme, the Government should endeavour to obtain the following assistance:
 - (a) One leather technologist for the beam-house and tan and dye yard;
 - (b) One leather technologist for the crust and finishing yard;
 - (c) One senior leather technologist for production, procurement, and marketing.

The first two technologists should have a minimum of 10 years experience in hides and skins and the third, a minimum of 20 years production and commercial experience.

5. A common pricing and discounting system should be introduced with a 6% discount on all sales from the tannery or its store in Aden and a 10% discount (ex-tannery) for sales through private agents or the tannery's own retail store, to be opened in Mukalla.
6. Thin and defective skins should be given a vegetable tanning treatment for further processing into semi-chrome, semi-aniline or corrected resin-finished upper leather or lining in order to fetch a higher price in the domestic and export markets.
7. A splitting machine should be obtained as soon as possible and a programme initiated for making split suedes, linings, and printed uppers into such products as bags or purses. Splitting would improve process efficiency and reduce wastage of chemicals.
8. Contacts should be made with long-term buyers for the range of products, otherwise, continuity of volume production, the economics of bulk output etc., cannot be maintained.

9. The Government should seek to co-operate with other countries on technological and marketing matters. Czechoslovakia, the USSR, Yugoslavia, and others, are already working on various types of collaboration in developing countries.

10. The tannery and the footwear unit should be organized as a common commercial operation under one management.

Annex I

SLAUGHTERHOUSE STATISTICS

Table 16. Animals killed in slaughterhouses, 1975

Governorates	First		Second		Third		Fourth		Fifth		Sixth		Total	
	Imported ^{a/}	Local	Imported	Local	Local	Local	Local	Local	Imported	Local	Local	Local	Imported	Local
Sheep	46,526	2,179	224	4,275	10,082	2,855	113	7,404	69	46,863	26,894			
Lambs		6,643		6,522	716	407		11,464			25,752			
Goats	48,202	1,903		3,084	16,292	2,978	300	14,579	893	48,502	39,729			
Kids		14,817		4,746	2,873	150		14,109			36,695			
Cattle	887	382		1,303	378	47		404	120	887	2,634			
Calves	112	309		8,411	32			173		112	8,925			
Camels		962		101	4	68		781	69		1,995			
Calves		139		13				163			315			
Total	95,727	27,334	224	28,455	30,377	6,505	413	49,077	1,151	96,364	142,939			

Source: Central Statistical Office, Ministry of Planning.

Note: On the receipt of green lamb and kid skins, the tannery reclassifies them. Skins of 2 ft² or below are considered lamb and kid skins; above 2 ft² they are considered as small-size skins.

a/ Hides and skins from imported stock.

Annex II

LEATHER IMPORTS

Table 17. Imports of leather and leather articles

	Unit	1974		1975	
		Quantity	Value (YD)	Quantity	Value (YD)
Finished leather	Kg	3,079	7,460	...	
Travel bags	Dozen	6,876	42,339	389	418
Leather clothes, belts	Dozen	9,791	24,514	2,523	5,124
Footwear with plastic/rubber soles and uppers	pairs	84,232	108,861	24,273	32,199
Footwear made from other materials	Pairs	145,360	14,177	393,840	103,391

Table 18. Production of leather and plastic items

	1973		1974		1975	
	Quantity	Value (YD)	Quantity	Value (YD)	Quantity	Value (YD)
Plastic sandals, pairs	201,952	24,613	357,547	62,644	590,142	112,051
Bags	72,830	51,024	126,716	96,586	85,083	20,992
Belts from wool	...	...	...	...	72,975	63,191
Leather footwear, pairs	...	...	...	...	25,384	44,488
Belts from other material with pocket	...	...	...	...	15,592	412

Source: Central Statistical Office.

Annex III

VISIT TO SLAUGHTERHOUSE IN ADEN
29 MAY 1976

The expert, together with his counterpart, the Manager of the National Tanning Factory, visited the slaughterhouse to evaluate resource potentials, quality and scope of improvement.

The following observations were made:

- (a) Average slaughter: 40 cattle per week;
- (b) Number of flayers: 14;
- (c) Quality of flaying: The flayers are all experienced but use pointed knives, resulting in a high incidence of flaycuts in hides with a loss of up to 50% in the surface area of finished leather;
- (d) No standard flaying knives are available, although the flayers are willing to accept improved knives;
- (e) The slaughterhouse could increase its capacity as much as 30 times with the same number of flayers.

Recommendations

1. An improved flaying knife should be introduced.
2. Incentives should be given for good workmanship, for instance, for flaying without cuts or with only five cuts.
3. If trials with improved knives prove satisfactory in the Aden slaughterhouse, flayers could then be sent to train flayers in other centres.

Annex IV

VISIT TO THE NATIONAL TANNING FACTORY IN ABYAN, THE THIRD
GOVERNORATE, 15 MAY 1976

The purpose of the visit was to assess the general conditions for the flaying, curing and collection of hides and skins, the methods of storage and grading and the purchase system. The expert was accompanied by his counterpart.

This factory is the co-operative for animal slaughter and meat distribution, a private sector collection and curing centre for goat and sheep skins, a meat market and a local workshop for the forging of knives and tools.

The following observations were made:

(a) Considerable damage is done to hides during flaying due to the use of the wrong type of knives;

(b) The method of pulling skins from goats and sheep is satisfactory.

Recommendations

1. After a thorough washing and draining, skins should be sprinkled with salt on the flesh side of each skin, then piled, flesh to flesh, on a slanted platform. About 50-60 skins may be piled in one lot and the piles may be left for four to six hours to allow further drainage of water.
2. A second sprinkling of salt should be made before piling the skins onto a flat surface.
3. Instead of making a cut in the hind legs to insert drying hangers (wooden sticks) to hang the skins for room-drying, wooden clips as already used for drying clothes, should be introduced and the skins hung from string drying lines.
4. The use of 0.1% of bacterioides, such as Preventol S, with the curing salt for both the first and second sprinkling, would enable the skins to be preserved in a wet-salted state under normal conditions for a period of six months or more. The introduction of Preventol S or equivalent products would avoid the necessity of drying hides and skins.
5. The drying of hides and skins after salting, or without salting, as extensively practised, causes putrefaction through retention or absorption of water, and causes the protein structure to gel through the exposure to sunlight and

the generation of heat during storage. Skins and hides can be preserved in a wet/salted condition with the help of preservatives which would also reduce the problems of soaking hides and skins.

6. The private buyer who collects raw skins from remote villages and supplies them to the tannery, processes these skins.

Annex V

PROPOSED PROCUREMENT CENTRES FOR RAW HIDES AND SKINS

Proposed centres

1977-1978	Seiyun and Mukalla
1979	Lahej

Current average monthly output of slaughterhouses

	Seiyun	Mukalla
Sheep	750	700
Goats	750	750

Costs per unit

		<u>YD/month</u>
Grader/supervisor	1	40
Worker for cleaning, curing, piling and storage	2	60
Rent, water etc.		<u>75</u>
	Total	175

Training requirements

Supervisor/graders	2	6 months
Worker for curing, piling etc.	4	3 months

The personnel of the rawhide store of the tannery have the necessary know-how to organize training.

Cost analysis with output targets

<u>Output</u>	<u>Mukalla</u> (in thousands)				<u>Seiyun</u> (in thousands)			
	1977	1978	1979	1980	1977	1978	1979	1980
Slaughterhouses	18	20	22	24	20	22	24	26
Private kills	<u>...</u>	<u>40</u>	<u>66</u>	<u>96</u>	<u>...</u>	<u>66</u>	<u>72</u>	<u>104</u>
Total	18	60	88	120	20	88	96	130
Cost in YD	2,100	2,200	2,300	2,400	2,100	2,200	2,300	2,400

	<u>Maximum</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Minimum</u>
	Fils			
Cost per skin	117	20	105	18.5
Salt and bactericides	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>
Total	122	25	110	23.5

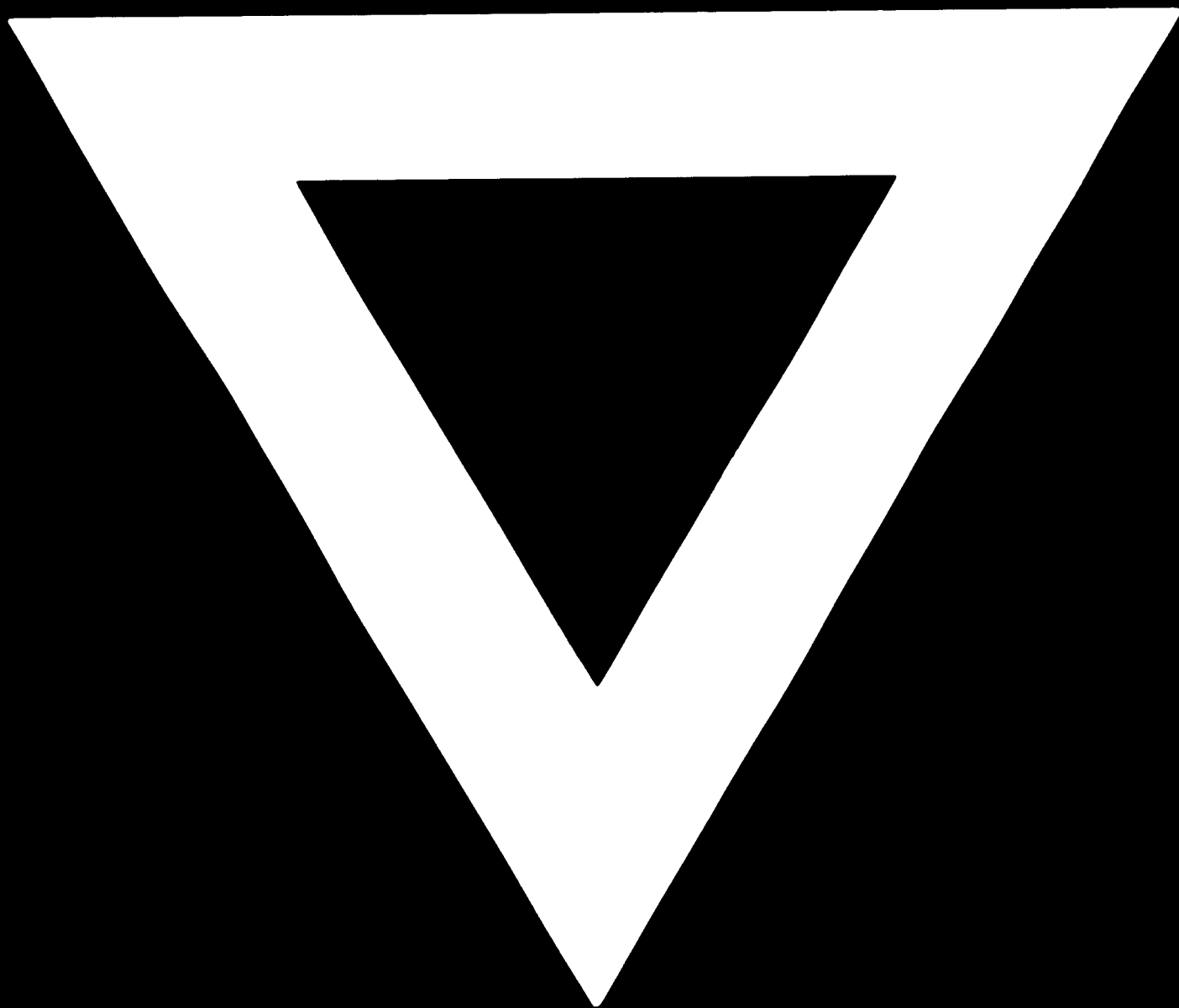
Salt consumption should be 40% of skin weight mixed with 0.1% bactericide.

Requirements for maximum output

Maximum daily output 430 skins
Average weight 430 kg
Daily water requirement 1,000 gal



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